

EXPERIMENTS TO TEACH ECOLOGY

A project of the Education Committee
of the Ecological Society of America



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J. M. Beiswenger, Editor

Cover illustration by W. Fertig

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PREFACE

The Experiments to Teach Ecology Project began in 1987 with an Education Committee of the Ecological Society of America appointed by Margaret Davis, then President of the Society. Committee members were Kathy Peterson, chair, Alan Berkowitz, Mark Kohn, and myself. We were assigned the task of assembling laboratory experiments that could be used in introductory biology classes at the college level. Too often Ecology, near the end of most traditional textbooks, is left out of laboratory curricula. We were to produce a collection of materials that would be instructive, fun to use and could be incorporated into the topical sequence with a minimum of effort on the part of the instructor.

The response to our initial "Call for Experiments to Teach Ecology" was very encouraging and we selected several of the experiments we received for testing and development. These were presented in workshops at the 1991 and 1992 Ecological Society meetings and are now contained within this manual. Although opinions differ concerning material that is suitable for introductory biology, all of these labs currently are used wholly or in part at this level. Various components of the exercises should prove to be useful additions to both introductory biology and general ecology classes. Hopefully, this collection will provide an impetus for "doing" ecology at the undergraduate level and students will enjoy the process and from it learn how to incorporate "science" into solving problems on their own.

We would not yet be at the printing stage without the help of many volunteer reviewers. They are acknowledged here with reference to the lab they reviewed. Mimicry: Edward Andrews, Ronald Baxter, Alan Berkowitz, Maria Minno, William Johnson, Cynthia Annette, Michael Zimmerman, Jane Phillips, Julia Krebs and Deborah Clark. Acidification and Ammonification: Scott Collins, Brian Shero, Jeff Simons, Michael Held, Mark Gould, Hye Jong Suh, Mark Brenson, and Deborah Clark. Population Ecology (experiments with protistans): Alan Berkowitz, Bette Nicotri, Jim Martin, and Jean Dickey. Population Growth (experimental models using duckweed, *Lemna*): Brian Shero, Lvnne Dee Oyler, Lawrence Cahoon, Janet Lanza, Jim Martin, David Potter, and Mark Wilson. Foraging and Flocking,: Michael Stokes, Joel Weintraub, Marianne Moore, Carol Harper, Deborah Clark, Maria Minno, and Mike Swift. Cemetery Demography- Deborah Clark, Mike Swift, Maria Minno, Frank Kuserk, Stephen Jenkins, Greg Murray, Beth Newell, Karen Talentino, Nancy Stamp, Michael Arthern, and Brian Shero.

Walter Fertig provided the cover illustration and those for the Acidification and Ammonification and *Lemna* labs. Jeff Beiswenger provided the drawing for Cemetery Demography. The students in my summer school workshop at the University of Wyoming deserve a note of thanks for helping, to test parts of five of these labs. These include: Sue Birkholz, Rae Mitten, William Fullmer, Linda Wobbe, Steve Stauffer, Evelyn Stauffer, and Lawrence McMullen. The Association for Biological Laboratory Education (ABLE) and ESA simultaneously discovered the Protistan Ecology and Foraging and Flocking exercises and kindly permitted the use of different versions here although they have already appeared in the Proceedings of ABLE's 13th Conference. Duncan Patten and Noreen Murray of the Society's Business Office have been very helpful with planning for the printing and distribution of the Manual.

We also thank the 1992-93 Executive Committee for their approval of the manual. Committee members are: Jane Lubchenco, Jerry Franklin, Judy Meyer, Ronald Pulliam, Katherine Gross, Robert Peet, Louis Pitelka, and Duncan Patten.

Very special acknowledgements go to Alan Berkowitz and Kathy Peterson. Alan was instrumental in the initial "Call for Experiments", he thoroughly reviewed three of the manuscripts and participated in the 1992 ESA workshop. Kathy Peterson has been invaluable as committee chair; she served as the committee's primary correspondent and organized the 1991 and 1992 workshops.

We hope these experiments will stimulate student interest in investigating ecological topics. As they may not completely reflect the most recent consensus of ecological theory, we encourage instructors to read pertinent, recent literature prior to using them.

Jane M. Beiswenger, Editor